

Preparation of Diacylglycerols from Hydrolyzed Palm Oil

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Diacylglycerols (DAG) are esters of glycerol in which two of the hydroxyl group are esterified with free fatty acids (FFAs). They are very used as emulsifiers in the food, pharmaceutical and cosmetics industries^{1,2}. These acylglycerides can be produced chemically or enzymatically through esterification, glicerolysis and partial hydrolysis processes. The enzymatic process are preferred because of their mild condition and safe products. Room temperature ionic liquids (RTILs) are intriguing solvents, which are recognized as 'green' alternatives to volatile organics.

The objective of this work was the attainment of diacylglycerol from hydrolyzed palm oil by the lipase-catalysed esterification reaction using ionic liquids (*bmim*[BF₄] and *bmim*[PF₆]) as solvents.

The reaction was carried out using glycerol, hydrolyzed palm oil, ionic liquid (1.5: 1:1) and lipase (0.5g). The substrate mixture was introduced into jacket reactor under magnetic agitation with and without vacuum. The temperature was controlled at 60°C by water circulation. The reaction mixture was washed with distilled water (3X15mL). The organic phase was extracted with hexane (3X15mL) and dried over anhydrous sodium sulfate. The solvent was evaporated by reduced distillation. The conversion was determined by gas chromatography. Different lipases and reaction time were evaluated.

A novozyme® 435 in 3h showed a conversion around 65% in presence of *bmim*[BF₄] *without vacuum* while a lipozyme®RM IM in 6h showed a conversion around 50% in presence *bmim*[PF₆] *without vacuum* under the studied conditions. The use of ionic liquid increased the conversion when compared to previous studies in absence them due greater stability of enzymes in ionic liquids³.

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2. Damstrup, M. L., et al, *J. Am Org. Chem Soc.* **2006**, 83(1), 327.

3- Sheldon, R.A., *Green Chem*, 2002,4, 147.